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ABSTRACT

This report describes a course in the Irish student-teacher curriculum that was designed in response to criticisms of post-graduate teacher training that it was too theoretical and insufficiently practical. The design of the Applied Psychology of Instruction course was based on the teacher-as-researcher paradigm of professionalism. Student teachers were asked to evaluate a limited variety of techniques, methods, and theories of instruction. This replicated previous research to test different models of learning in order to consider their value for their own future use. In so doing, student teachers received training in classroom research and reflection as it focuses on instruction. A comparison was made between 91 student-teacher reports and questionnaires completed in 1995 and responses to a similar questionnaire by 79 student teachers in 1991. Findings support Galyean's (1993) thesis that guided cognitive imagery can improve performance and enhance motivation and discipline, especially for low achievers. Student teachers in 1995 learned that pupils appreciate variety and novelty and that they do not all learn in the same way; they learned to refine the perception that they had about their pupils. Student teachers also learned the design, statistical analysis, and interpretation of classroom tests. Although most student teachers did find the imagery exercise more useful that they originally thought, gender-specific differences in attitudes toward the reports were noted. The survey results and syllabus for courses in Applied Psychology and Curriculum Studies are appended. (Contains 22 references.) (NAV)

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Theory into practice through replication of research in student-teaching practice: a partial evaluation of a course

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Theory into practice through replication of research in student - teaching practice : a partial evaluation of a course

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Abstract

A course designed to respond to criticisms of post-graduate teacher training that it is too theoretical and insufficiently practical is described. Developed over the last decade, this course is based on the teacher as researcher paradigm of professionalism. Student - teachers are asked to evaluate a limited variety of techniques, methods and theories of instruction . As such, they replicate previous research or test different models of learning in order to consider their value for their own use in the future. During the last decade nearly 5,000 reports have been submitted for assessment.

From time to time the attitudes of the student - teachers to each of the activities have been obtained. In addition, the reports themselves contain a wealth of information about the experiences of the student - teachers and their pupils in the implementation of these activities. Such data can be subjected to various levels of meta - analysis in which the reports are searched for common factors about teaching in general, previous research in particular, and models for which little research exists.

To illustrate these points more specifically, student - teacher attitudes to the implementation of imagery in the classroom in 1995 are described. These reports and those of a previous inquiry in 1991 lend support to Galyean's (1993) thesis that guided cognitive imagery can improve performance, especially of low achievers, as well as enhance motivation. The proposition that discipline is also enhanced (Curwin and Mendler,1988) is also demonstrated.

Although these student - teachers recognise that the 'novelty' dimension may have been an important factor in these results the majority say they are likely to use imagery again, even if only sparingly. There is a need to establish the classroom conditions in which imagery is likely to be most effective, and if a multiple - strategy approach to teaching and learning is to be introduced teachers will have to plan courses rather than single lessons as they become immediately due.

There are evidently differences in the attitudes of male and female student - teacher towards the exercise which are also reflected in their reports. This dimension needs to be investigated in much more detail in the future.

A goodly proportion of the sample reported that as a result of the exercise they had changed their attitude towards teaching and in particular towards the control of their classes. Since there are similar positive reports about the other exercises in the course, this approach to relating theory to practice would appear to be fully justified.

Setting the scene: the problems defined

In each of the five countries that make up the British Isles children in their last year of compulsory schooling sit a common public examination which tests their knowledge in each of the subjects they have taken. In Ireland this examination - called the Junior Certificate - is normally taken at 15 years of age, after three years of post - primary education in either community, secondary or vocational schools. Those who remain at school for the senior cycle of post - primay education also take a public examination after two, or sometimes three, years. In Ireland this examination is the Leaving Certificate, and until recently the majority of students taking this Certificate would be in the age range 16 - 18. As in the others countries of the British Isles this examination is used by the Universities as the principle instrument for selection. Between the different countries there are considerable differences in structure (number of subjects to be taken) and content in which the universities have no small say (Heywood,1989). The effect in all these countries is that the senior cycle school curriculum and its assessment is driven by university entrance requirements: this spills over into the junior cycle because performance in the Junior Certificate is used to indicate potential in the senior cycle.

Those examinations, which in Ireland are set by the government's Department of Education, have a pervasive influence on teaching. As might be expected in such circumstances there is a well-established mythology about the methods of teaching required if students are to pass these examinations. In Ireland it was held by many teachers that primarily these examinations demanded a regurgitation of the knowledge to be covered. Therefore the only way for students to learn was by whole class, teacher centred, chalk and talk teaching for which little skill was required if the classes were to be tightly controlled.

A government committee, reporting in 1974, said of the intermediate examination (as the Junior Certificate was then known):"what it assesses, however, in the way of skills, knowledge and understanding, is much narrower than what the pupil has actually learned from and through school. The examination has not extended itself to many skills which go to making up a well - balanced general education, and which schools try hard to develop: some cognitive, such as creative or critical thinking, which a classroom teacher can assess from oral, practical and project work, responsibility, capacity to work with others, which will be crucial to the individual's future, but which for practical and administrative reasons fall outside the scope of the Intermediate Examination" (ICE 1974).

These issues were taken up in the eighties by government - appointed boards, and in1989 it was agreed to replace the Intermediate Certificate with a

new Junior Certificate. It was to remain a public examination in the control of the State. The syllabuses were to be revised and it was intended that the objectives of assessment would encourage diversity in instructional practice.

Previous independent research in Ireland should have alerted the Department of Education to the fact that substantial training is required if teachers are not only to change their attitudes but internalise new objectives and stratagems (Murphy, 1976). In-career training has to be done in depth and at great cost of time if it is to succeed in bringing about substantial change (Steffens, 1992). But a response is also required from those responsible for initial teacher training.

The university courses in Ireland for the training of graduates for secondary school teaching were not exempt from international criticisms of teacher education that the content of initial training courses was too theoretical and remote from the classroom. Indeed, in the early seventies they had been rebuffed by the Department of Education in England, who refused to accept their qualification on the ground that it was insufficiently practical. It is not an understatement to say that graduates in those days viewed the Higher Diploma as an unfortunate hurdle to be passed if they wished to become teachers in secondary schools. Some dissatisfaction with the Higher Diploma has also been expressed in a recently published White Paper on Education (Department of Education, 1995). It calls for " the provision of an extensive programme to develop the pedagogical and classroom management skills of student-teachers through wide and varied teaching practice".

If the universities did not accept these criticisms they had a problem with their image. If to a greater or lesser degree they had to find out how to demonstrate the relevance of their courses to practice. The central concern of this paper is with the relationship between theory and practice in the area of instruction, and an attempt to demonstrate a positive relationship between the two in teacher education within the contexts described above.

In the late 1970's the Department of Teacher Education of the University of Dublin divided the psychology course offered to its graduate trainees in two. The first part, although shortened, was to carry on very much as before with a focus on adolescent behaviour. The other part was to focus on the theory and practice of instruction. A small course in curriculum studies was also introduced. There already existed methods of teaching courses and associated workshops in each subject specialism.

This new course in the Applied Psychology of Instruction was examined separately. The intention of the course was to provide a general basis for the study of methods and the workshops.

In theory the opportunity for the integration of theory and practice was great because the one year diploma was essentially school-based. Student-teachers taught their subjects in school throughout the whole of the school year. During the academic year of the university the student-teacher continued to teach for two and a half days per week, while they attended the university

on the other two and a half days for the theoretical studies and methods work.

In the Irish system of training the graduate student-teachers are appointed by the secondary school. The University department has no role in these appointments. However, the students have also to be admitted to the University, and this is a selective process. The University is required to supervise and assess the training in schools.

Traditionally the major theoretical courses (philosophy, sociology, psychology, history and comparative as applied to education) had been assessed by written essay-examinations at the end of the course. Thus, any change had to be sought within this context, and would have to come about through alterations in the examination questions in the paper set to examine the Applied Psychology of Instruction.

It was argued that in a normal course lectures would be given in different methods of instruction and student would record them in their notes in order to regurgitate them in their examinations. The students would not, it was reasoned, try them out in practice. In order to remain within the prevailing plausibility structure it was decided to alter the style of questioning in the examination. Students were told that in their responses to the questions they would have to demonstrate that they had tried out the theories covered in the lectures in the classroom, and give an objective evaluation of what had happened when they tried them out

Of course it is possible to fake examination answers, but a detailed analysis of the answer papers between 1987 and 1980 suggested that a large number of the answers were genuine. It is open to the reader to judge whether this is the case, since a book was written and published for the course in which the illustrative material was taken from those answers (Heywood,1982).

It was recognised, however that this was a weak, if not unsatisfactory, approach to the problem; and in 1984 a substantial change was made and course work assessment was introduced. Now the students were required to design a lesson, try it out in practice, and report the findings. For example, a lecturer would discuss Gagne's principles of learning and the students would implement a lesson based on his procedural model for learning concepts and principles. On other occasions they would have to implement Bruner's Expository Instruction stage model, Ausubel's advanced organiser, contrast discovery learning, and design lessons to develop aspects of creativity and with problem-solving.

By this time the course in Curriculum Studies had been developed and a book, also using student examples, had been published (Heywood, 1984). It included three chapters on accountability. Beginning with Eisner's (1989) notion of educational connoisseurship, these chapters focused on self - accountability (or self - assessment as it is now known) through classroom evaluation and the exercises undertaken by the students became much more research - oriented, leavened by a demand for connoisseruship and

reflection. Six or seven activities were undertaken in all. An examination was retained at the end of the year.

The approach was eclectic, and designed so that students would implement a variety of methods and then evaluate the potential of each method for teaching while comparing it with the expository mode of instruction that was the norm. By 1987, partially stimulated by the students desire for a detailed assessment schedule, a complex assessment scheme had evolved which had additional goals to those with which the course began (Exhibit 1). These were:

- To assist the student-teacher to develop skill in teacher-led inquiry as it relates to course development, lesson design,implementation and evaluation

- To relate their teaching activities to curriculum, instruction, and self-accountability through educational connoisseurship reflective practice), and in this way to develop a professional attitude.

In the process of achieving these aims student-teacher practise:

- reviewing educational research
- formulating hypotheses for the evaluation of instructional theories in the classroom
- planning lessons within normal curriculum programmes to test these programmes
- designing tests that assess both content and instructional method
- evaluating tests
- assessing themselves and their pupils
- analysing complete activities for affirmation and for change
- looking at their classrooms as laboratories for research
- understanding the limitations of their work

To achieve these goals the students undertake six practical inquiries. They also undertake a seventh activity designed to test their ability to perceive and formulate a problem in the classroom and subsequently devise a strategy for its implementation and evaluation on their own. (Heywood, 1992). The syllabus for the 1995/96 course is given in the Appendix.

The six practical inquiries required for completion of the course are:

1. The role of exemplars and non - exemplars in the teaching of a concept (Heywood, 1994).
2. The matching of teaching to learning styles (Heywood, 1992, Fitzgibbon, Heywood and Cameron, 1991).
3. The use of heuristics in the teaching of higher order thinking skills: critical thinking, problem solving and decision making (Heywood, 1993).

4/5. The merit of discovery versus expository learning: involving two lessons (Heywood and Heywood, 1993, A and B).

6. The merits of imagery in classroom learning and behaviour.

The references are to partial evaluations which have been published already. The only activity to date that has not been subject to evaluation is the imagery exercise, and to illustrate the scheme a partial evaluation of this exercise is described in the second half of this paper. But first some remarks on the potential of the student - teacher questionnaries and reports (when considered in aggregate) for research and develpment on instructional theories and models.

The two dimensions of evaluation

The first dimension of evaluation is that which the student - teachers do to test the value of different models of instruction in practice. It is this that is likely to influence their later practice. The assessment procedure is designed to meet the specific objectives outlined above (see Exhibit 1).

One of the reasons why student - teachers in general are not encouraged to experiment with different instructional theories is that there is often very little published evaluation, and often the findings seem to be contradictory: moreover, the studies are not usually exact replications as one might expect in scientific studies. This scheme encourages them to experiment with different theories and techniques and arrive at their own conclusions.

The second dimension of evaluation arises from the fact that, even if each case study is extremely limited, there are upwards of 500 substantial reports on each activity (between 70 and 100 per annum) which can be evaluated. This makes it possible for the assessor and/or independent scrutineers to evaluate the detail of the reports to see if, overall, they lend support to the claims of the original research or model. Moreover the analyses can be supported by questionnaires on each activity which might add to the picture given by the initial assessment.

At the least, information about the success or failure of each activity will be provided and examples of good and poor practice yielded. It is the purpose of this paper to demonstrate these points primarily through the analysis of the student-teacher responses to the questionnaires and their comments.

In theory it may also be possible, from a very detailed analysis of the reports, to formulate a taxonomy that would indicate the conditions in which a particular activity is likely to work best and the objectives it is most likely to meet.

So far this has eluded the evaluators, but it has been possible to derive numerous examples of what is considered to be good practice and some have already been published (Callaghan, 1991; Carroll, 1991; Donovan, 1993; and Lydon, 1993).The principles and objectives of the assessment are now described.

Assessment

(i) Principles As indicated above, the assessment procedures evolved from simple holistic marking with equally simple comments to a rather sophisticated schedule, which is best described as semi - criterion referenced (Exhibit 1). Since it was primarily concerned with the assessment of research and evaluation skills and not with the subject content of the lesson, it was hoped that a common scheme would suffice for all the activities. However, after several years of operation it was concluded that students would be helped if there were some points that specifically focused on the particular activity. So now each scheme is specific to the activity, but the main headings remain and the student-teachers commonly use the jargon of the main category headings.

The scheme in Exhibit 1 was used to assess the imagery exercise in 1996 when the imagery exercise was included in the learning styles activity.The criteria follow the same process of planning, implementation and evaluation that is expected of the students.

A requirement of the Irish Department of Education is that the Diploma should be graded at different levels of honors. This implies pseudo - norm - referenced systems of marking in which each report is compared with every other script. Thus the assessors have to look for insights and skill in each category which will enable them to distinguish between the scripts. The marks in each section, therefore, are intended to indicate relative weightings. The assessor gives an overall impression mark on the basis of his or her comparisons with the other scripts and checks this against the criterion marks. If there are substantial discrepancies between the assessor's and the student's marks the assessor provides a written comment as to why. It is open to the student to re - negotiate the impression mark. A danger with this system is that criterion referencing encourages a minimalist approach, and students check off when they think they have covered the item. Often their coverage will not be to the assessor's satisfaction.

The schedule and the exercise are also discussed in class. It has been found that students take up particular issues at this time and since these vary from year to year the reports show them to cause variations in the interpretations of what students think is expected of them. They have not had drastic implications for either the assessment or the second dimension of evaluation, although changes are regularly made to the criteria, i.e. in the way they are expressed, both for clarification and to take up weaknesses spotted in the assessement.

Each assessment may take between 20 and 40 minutes to mark. During the marking the assessor also begins the second dimension evaluation by noting ideas and facts that have relevance to research and /or the training of teachers. Written permission to use reports or data from them as exemplars is sought at the time they are handed back. Any questionnaire associated with the activity would be given at that time. This conditions the sample size since there is always a small group of students who never wish to collect their work, but inferences can be made from these reports.

(ii) Objectives Irrespective of the activity, each report should be accompanied by a statement of the entering characteristics of the students. This has two objectives. The first is to help students develop skill in pupil judgement over the year and to make them realise that they can all too easily make simplistic judgements. They are therefore advised to create a student record system, particularly if each activity is to be conducted with the same students. The exercise on learning styles has this objective particularly in mind. The second objective is to help their powers of reflection. Student-teachers find it particularly difficult to put themselves in their pupils place- that is, to see how their pupils perceive the lesson . They also find it difficult to consider specific students. They should therefore relate their responses in Evaluations I, 2 and 3 to the entering characteristics of their pupils. They are also too ready to accept a performance that conforms with those obtained in previous tests, and do not ask the question 'what could I do to improve the performance of those in difficulties?' Early versions of the schedule asked "What do you propose to do about such students?" In the most recent imagery exercises they were asked to include a prediction in the entering characteristics as to how their students would respond. Many surprises were expressed in their evaluations.

The literature the students are required to read is well defined and limited. They are supposed to focus on the research that has been done, and to summarise its findings. Even though they are graduates many have difficulty in distinguishing between narrative and theory and the findings of particular research. In the case of the imagery; they are given a short article by Galyean (1983) in which four kinds of imagery are described. These are Guided Cognitive Imagery, the purpose of which is to develop thinking skills and mastery of learning; Guided Affective Imagery, which is used for awareness and acceptance of self and others; Guided Transpersonal Imagery, which is to promote transpersonal awareness and growth; and Confluent Imagery ,which involves any two of these. The students are asked to choose one method and try it out in the classroom. The great majority select guided cognitive imagery, although teachers with experience in moral and religious education may select one of the others. After 1990 their attention was also drawn to a practical book on scripted fantasy in the classroom (Hall et al, 1990).

Many student-teachers have difficulty focusing and timing their classes. Stating objectives clearly should help them focus, and reflection on each should give them some idea of the time required for their achievement: there is a tendency for student-teachers to try to do too much. Objectives are also important since they provide the criteria against which the outcomes can be evaluated (Evaluations 2 and 3). They also provide criteria for classroom test design, and over the year students learn that this is not always easy.

Early on it was found that the students had difficulty with the final evaluation: they could not perceive how things might have been done differently. To try to develop this skill students were given more recent papers on the topic, asked to read them and note their central points, and, having done this, to say whether they would have approached the lesson

differently. In the case of the imagery exercise the paper has always been by Susan Alywin(1988).

In response to criticisms that the reports could be plagiarised or imagined and the lesson activity not actually done, the students are required to submit examples of their pupils work, usually their test sheets. This has, in fact turned out to be of great interest,and in the future students will have not merely to provide samples of work but discuss them within the body of the text. The value of this to the imagery exercise will be immeditately apparent, especially when it is designed to bring about improvement in creative activities such as drawing and written or musical composition.

Finally , students are not penalised if an exercise goes wrong, provided they complete the evalutations and show what insights they have gained. Neither are they penalised if as a result of their evaluation they take a negative view of a particular model of instruction. The overall purpose remains that they should have experienced it in practice and come to an informed judgement on the basis of that experience, rather than on their reading.

So what have the students learnt from their exercise in imagery and what can we learn from their experience-in this case, primarily from their responses to the questionnaires?

The student-Teachers

There were 112 teachers in the 1995 class, of whom 91 responded to the questionnaire; one of these was incomplete. Since the questionnaires were issued at the time the reports were returned to the students after assessment it is possible to infer answers from the whole group, although it does not permit a faithful reconstruction.

The responses are reported for the 91 responding to the questionnaire and 79 who responded to a similar, but not identical, questionnaire in 1991. If general conclusions are to be drawn the concern is with the extent to which the response profiles are similar from year to year. As will be seen there is considerable similarity between the responses obtained in 1991 and 1995.

It will be seen from Table 1 that the majority of the student teachers have their classes in the junior cycle, and the first year at that. This is consistent with profiles obtained in other years (Figzgibbon, Heywood and Cameron, 1991; Heywood and Heywood, 1992, 1993).

There were 62 female and 29 male student teachers in the 1995 class and insofar as there seem to be differences in their responses these are noted in the text.

The student-Teachers' Experience

Although the majority of students have come to the course straight from university there is always a group of mature students some of whom may

have used imagery before. Some of the younger students may also have experienced it when they were at school. But for the majority the idea that they should conduct a class using imagery comes as a shock. It is an idea that lies outside their plausibility of effective teaching. Moreover, it is easy for them to posit! that their pupils will think it ridiculous and that the teacher has gone mad! It is to be expected, therefore, that these student-teachers would approach the exercise with some fear. In any event it is reasonable to expect that anyone approaching such an exercise for the first time might be a little nervous.

Of the 91 respondents to the 1995 inquiry (see Table 2) only three said they approached it fearfully, but 35 said they approached it nervously. Taken together they represent 40% or so of the respondents. This compares with approximately 38% in 1990 and approximately 47% in 1991 responding to a similar question (Heywood, 1992) About half gave as their reason the belief that the students would treat the exercise as a joke, while 8% were worried about their ability to present the imagery. It is of interest to note that three of those who had experienced imagery before were worried; 14 (N=25) of those who claimed to have approached the exercises with confidence also said they had prior experience of imagery. Of this group of 25, seventeen had approached the lesson with confidence and eight had approached it like any other lesson. As a proportion of their group somewhat more males approached the exercise nervously than females, and fewer approached it with confidence.

The descriptions in the reports of what actually happened show that classes do respond with giggling and chatting, but calm down. There are very few instances of a total collapse, at most two or three per year. Unfortunately the question set to determine the extent of peer group pressure (Table 3C) only indicates that in many classes certain individuals exercise some power over their peers; several of the descriptions in the reports show this to be the case.

Teacher attitudes towards imagery might condition the behaviour of the teacher during the class. Some report that this was so. From the questionnaire it seems that only about a quarter of the sample believed in the potential of imagery before the lesson. As a proportion of their group more males were very sceptical than females. They were also more ambigious and had less belief in its potential. However, it appears that 57 of the student-teachers found the exercise to be more successful than they had anticipated, and only 3 found it less sucessful. There were no differences between the males and females in this respect. Of the 35 who were very sceptical, somewhat disbelieving or open-minded, 25 recorded it to have been more sucessful. Of the same group 11 were very surprised, and of the total group 62 were either surprised or very surprised by the impact that the lesson had on them, and from other answers as well as inspection of the reports it is clear that the direction of their thinking towards this lesson is positive rather than negative. The male student-teachers seem to have been less surprised than the females. All but two of the student-teachers say they are likely to use imagery in the future, if only sparingly (Table 5): as a proportion of their group, more males will use it sparingly than females.

In previous inquiries in 1990 and 1991 student-teachers were asked if they considered it risky to try this exercise with their class. Approximately 36% and 46% respectively replied yes. Having given the lessons the majority said the risk had been worth taking and that in the future they would be willing to take other risks (Heywood 1992) .

In consequence, no patterns can be found in respect of subject taught or age of the pupils, although many student-teachers have reservations about the individuals to whom it can be taught, and there do seem to be some differences between the males and the females.

Various studies have suggested that some teaching methods which encourage imagination have a calming effect on behaviour. Guided fantasy, meditation and tension relaxation exercises help (Curwin and Mendler, 1988). The student teachers in this course receive instruction on how to do such exercises, and many of their descriptions show they begin the lesson with some technique for relaxing their students. Of these 38 reported that the exercise had the effect of calming the students down and 10 said that behaviour was improved (Table 3). Only 5 said the imagery exercise made them more boisterous.

In the 1991 inquiry (Table 6) 40 (approximately 50%) said there was an improvement in discipline among those who were naughty and 9 (approximately 11%) said it made the class more naughty.

It has been argued that girls do better at school because they are more compliant (Daly, 1995). In some classes this seems to have been the case (Table3B). However, many of the respondents were teaching in single sex schools and in Ireland these far out number co-educational schools at the moment.

As seen by the student-teachers three-quarters of the classes both enjoyed the lesson and were more motivated than usual. 67 said that in future they might use imagery to enhance motivation,and of this group three quarters said they would use it with mixed achievement classes (Table 5).

The majority of teachers in the 1991 inquiry considered that the self-esteem of the low-achieving students had been increased by participation in the imagery (Table 6). This question was not asked in 1995, but several of the students reports suggested this to be the case. Several students in 1991 suggested that the benefits for the low achiever might only be short-lived.

This point raises the question as to how teachers can in practice continue with lessons which will help the students retain the benefits for learning and self-esteem over much longer periods of time: insofar as the students are concerned, all of the exercises were relatively novel except, perhaps, in the first. In all, the student-teachers report an increase in motivation. Clearly if one method is over-used boredom will set in. The need to produce profiles which indicate the type of objectives that may best be achieved by each kind of activity is evident. It is equally evident that to obtain the benefits of multi-strategy approach to instruction that teachers should generally plan

their lessons within the framework of the course and the objectives to be obtained, rather than planning them separately and possibly immediately prior to the lesson.

It is claimed that guided imagery can enhance learning (Galyean, 1983) and influence memory (Parkin, 1993). The student-teachers said that it enhanced interest (61) and focused attention(54). Seventy said that it improved cognitive performance (Table 4). Given that this view is very often based on tests given a week or so afterwards it might be inferred that there was some improvement in memory; however, this is a matter that requires further and more detailed investigation.

Many student-teachers were surprised by the impact of the exercise on the low achievers: 75 said that it improved their performance, a result which gives substantial confirmation to Galyean's thesis. In the reports there are some quite startling demonstrations of this point, as for example, changes in creative writing technique and drawing ability. Sixty reported an improved performance among their average students. However, a disturbing feature, confirmed by comments in the reports, is that only 14 felt the lesson improved the performance of the high achievers. To put it in another way: 67 reported that the high achievers performed as they usually do. This is a a matter that needs to be further investigated, since the reports give little indication as to why this might be and the questionnaire did not seek to ascertain the effects of the class on their motivation. It is very difficult to improve on good performances (Carter and Heywood, 1991), but at the same time the lesson may have helped motivate some students to maintain their performance. It is also possible that the student-teachers are deceived by this point, since few believe that imagery will work with all pupils or adults: 69 believe that it will work with some adults. There are in each year reports of work with adults who have come back to try to pass the Leaving Certificate. In some cases the imagery has been surprisingly sucessful with them but in others this has not been so. Those who said it would work with some adults were not asked to indicate what sort of adults they might be (Table 4). In contrast to the 15 who said it would work with all pupils in senior cycle, 38 (approximately 42%) said that it would work with all pupils in the junior cycle. It seems from the replies to the previous question that the response of the high-achieving pupils to the lesson may have infuenced this perception.

If these student-teachers use imagery in the future 77 will use it to provide variety in their teaching and 67 will use it to enhance motivation. But 58 and 67 respectively will use it to try to enhance cognitive performance and/or creativity. (Table 5B).

In 1991, when the imagery exercise was the second exercise, 34 students (approximately 43%) reported that the exercise had demanded a considerable change in attitude toward their teaching and as a result 31 of them had experienced a "permanent change in their teaching as a result of the imagery exercise". (Table 6) . Thirty-seven of the student-teachers (approximately 47%) said that it had caused them to change their role as a teacher and of these 35 made additional comments. Of these, 16 related to the control of the class. For example they learnt to "work more in the background", be

"passive", act as, "facilitator", or as a "directress guiding" "get them to participate more in class", and to be "more informal". Several said they gave the students "more control over their learning" or got them "to take responsibility for their learning". One respondent said that for ten minutes he was in total control, which he had never been before. Another said she "became part of a group involved in a bonding exercise".

Five drew attention to the need to respect pupils creativity and the responsibility they had for the cultivation of the imagination, and one said "I will try to be more imaginative in class". Others recorded that they had learnt the importance of variety in teaching, the value of experiment,the value of radical techniques, the importance of self-concept, how students learn and that it had "created a better relationship with the girls".

Conclusions

A course designed to respond to criticism of the education of post-graduate student-teachers that it is too theoretical and insufficiently practical was described. Based on the teacher as researcher paradigm of professionalism, student-teachers are asked to evaluate a limited variety of techniques, methods and theories of instruction. This involves them either in the replication of previous research or the investigation of certain models and techniques of instruction during their classroom practice. In so doing they receive training in classroom research and reflection as it focuses on instruction. Relatively substantial reports of the design, implementation and evalutation are required for assessment and feedback. Students have to show that the pupils understand the assumptions made and the limitations they impose on their findings.

These reports may provide a second dimension (level) of research since they are presented in a form that is open to further analysis by the tutor at the time of assessment and later by independent investigators, if desired. Moreover, course evaluation instruments can be replaced by activity-focused attitude questionnaires. The evidence is that at the very least the reports contain insights that would in all probability not be revealed in responses to questionnaires. They also contain examples of effective practice the judgements of which may be obtained by comparison of the reports one with another.

A somewhat more detailed approach would apply meta-analysis to the reports at one or another level of sophistication. This has been done, for example, by comparisons of discovery with expository method of instruction (Heywood and Heywood, 1992). Such analyses may also seek to determine the conditions in which a particular method of instruction is likely to be more effective than others. If several methods are investigated in this way it may be possible to classify instructional methods against the objectives they are most likely to obtain in particula teaching environments. Validity is obtained by regular repetition of the exercise and teacher training courses enable this to be done. Because the samples are small the activities need to be repeated from year to year in order to test that the profiles are relatively similar and that thereby the data are consistent. In this case it has been

possible to compare some data obtained in 1991 with those of 1995. Considerable similarities were found.

In this case a relatively minimalist approach has, of necessity, been adopted by the tutor. In the first place the reports have been used to illuminate responses in the questionnaires and other items not covered by the questionnaires (Heywood, 1992; 1993; 1994). Secondly, they have been examined for examples of effective teaching for use in the instructional training of student teacher (Callaghan, 1991; Carroll, 1991; Donovan, 1992; Lydon, 1993). Finally, they have been examined for specific trends. For example, do the reports, of which between 80 and 100 are presented each year, confirm the value of the instructional model being investigated or affirm the research replicated? (Cameron, 1991; Heywood & Heywood, 1982B)

A major limitation is that the number of such exercises which can be undertaken is severely restricted by the time available in a one-year programme, and the competing demands of other courses within that programme. The students recognise this to be the case and many reports draw attention to the fact that since each activity is a 'once-off' exercise they would be reluctant to draw general conclusions from same. At the same time, within the Irish context, a government White paper (1995) has drawn attention to the need for initial training courses to broaden the instructional and assessment skills of student-teachers on graduation. If such a course is to respond to this need then it will have to be extended in time, and this might prove to be possible only with the introduction of an induction year.

It is evident from the reports that these student-teachers learn about and evaluate theories and techniques of instruction because they have to implement them as part of their assessed course. Moreover, they learn that their pupils appreciate variety and novelty, and that they do not all learn in the same way. They learn to refine the perception they have of their pupils. It may be argued that these findings alone would be sufficient to justify the course. But the student-teacher also learns things which, while apparent to the assessor, are not readily apparent to themselves — for example, the design, statistical analysis, and interpretations of classroom tests.

To illustrate these points more specifically student-teacher attitudes to the implementation of imagery in the classroom were described. Some comparisons between this 1995 exercise and a similar exercise in 1991 show considerable similarities in the distribution of responses to approximately similar questions.The findings are coterminous.The problem was to select and evaluate one of Galyean's (1993) methods of imagery in the classroom. Most chose to undertake guided cognitive imagery; a small number of successful lessons in the other modes have been given.

Many student-teachers found the exercise to have been more successful than they thought it would be. A substantial number reported improvements in the performance of low-achieving students which conforms with Galyean's findings. However, some students reported little change in the performance of high-achieving students, although no evidence was reported of a loss of motivation among this group.

In keeping with other research it was also found that imagery had the effect of calming the students down in nearly half the classes. At the same time the students recognised that this could have been due to the 'novely' effect of the classes. Training the pupils in the value of imagery as for example in examinations might offset the novelty factor.

The enhanced motivation that such classes give could create problems for the student-teacher (or for that matter any teacher) by raising expectations for subsequent classes that cannot be met. This implies that instruction should not be planned on a piecemeal basis (i.e. planning lessons as they become due), but for the course or unit of the course as a whole and as part of a multiple-strategy approach to teaching and learning. The majority of the student-teachers in these inquiries say they are likely to use imagery again, if only sparingly.

Some differences between male and female students were found in their attitudes prior to and after the exercise.These need to be investigated further.

A goodly proportion of the 1991 sample reported that the exercise had changed their attitude towards teaching and in particular towards the control of their classes. Since there are similar reports about the other exercises (Heywood, Fitzgibbon and Cameron, 1991; Heywood, 1993), this approach to integrating theory and practice and the development of more professional attitudes would seem to be fully justified.

A fair criticism of this work is that more could have been done to integrate the supervisors (mainly part-time teachers) into the framework of assessment.

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EXHIBIT 1: Assesssment schedule used for the Imagery exercise

Name:_____

Subject taught:_____ Class:_____

	Self	Tutor
1. Entering characteristics - five columns *Max. 10 marks* (1) List of students (2) Indicate your preception of your students learning style (3) Basis for statement (4) Your estimate of students' reaction to imagery e.g. will take seriously/will not take it seriously (5) Their previous performance. Short statement of where they are at.		
2. Statement of : *Max. 10 marks* (1) Aims (2) Terminal objectives and (3) Concepts or principles to be learnt.		
3a. Lesson Plan: Learning Styles Component. *Max. 10 marks* (1) This should be presented in phases related to the Kolb Learning Cycle These should demonstrate you understand the theory behind the model. (2) A short description of the content to be covered (3) The methods of instruction to be used.		
3B Imagery Component *Max. 10 marks* If you use imagery for the whole lesson you should before setting out the lesson plan state which kind of imagery you are going to use. If you use it for one of the phases put the *imagery* in the phase and explain what you intend to do on a separate sheet. Indicate type used.		
4. Test a test designed to *Max. 15 marks* (1) meet the objectives of the lesson (2) evaluate the value of learning styles theory (3) evaluate the value of imagery		
5. Evaluation - 1 *Max. 10 marks* (1) Your response to the lesson (2) Pupil response to lesson. In responding take into account both Imagery and Learning styles.		
6. Evaluation - 2 After the test *Max 15 marks* (1) Summary of test data (2) In relation to past performance (3) In relation to the styles you assigned (4) The imagery component.		
7. Evaluation - 3 *Max. 20 marks (15 +5).* **A.** ***Both Learning Styles and Imagery. Should include comment on the following :*** (1) What did you learn about your students as a result of the exercise and (2) In terms of your prior judgements [see 1 above] **B.** ***What did you learn about yourself in relation to teaching and learning styles ?*** **C.** ***Given the evaluation literature*** (1) Should teaching styles be matched to learning styles? (2) Should students have to learn a variety of learning styles? (3) How would you determine pupils' learning styles in future ? **D.** (1) What did you learn about imagery? (2) What are your views about imagery now that you have read the Evaluation Literature? (3) Should students be given practice in imagery so that they can learn to use it for themselves?		
Impression Mark - Max. 100 **(deduct up to 10 for poor presentation)**	***Self***	***Tutor*** .....

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SUBJECT AND NUMBER OF IMAGERY LESSONS (1995)	YEAR 1 (12-13)	YEAR 2 (13-14)	YEAR 3* (14-15)	TRANSITION YEAR (15-16)	YEAR 5 (16-17)	YEAR 6** (17-18)
Business Studies (incl. Economics)	5	3	1			
Biology					2	1
Classical Studies				1		
English	5	6				
French	2	1		1	1	
German	3	2		2		
Geography	2	1			1	
History	3	1		4		
Irish	3	1				
Mathematics	6	1		1		
Music	5	1				
Religious Education	2			1		
Science	14	3				
Spanish	1			1	1	

Table 1: 1995 respondents and subjects in which they used Imagery and the class year to which they were taught.
Taken from questionnaires after lesson plan had been returned.

*Junior Certificate taken at the end of this year; **Leaving Certificate taken at the end of this year.

		No. of respondents
A.	Ease or difficulty of planning Imagery lessons with other lessons.	
	Much more difficult	8
	More difficult	41
	Similar	27
	Easier	13
	No response	3
B.	Approach to Imagery lesson	
	Fearfully	3
	Nervously	35
	Like any other	30
	With confidence	20
	No response	3
C.	Reasons for the fearful and nervous disposition in B.	
	Pupils would treat it as a joke or misbehave	19
	Ability to present the Imagery	8
	Prior experience with Imagery	3
	Other	8
D.	Reasons for disposition in B, if confident.	
	Belief in effectiveness of Imagery	11
	Prior experience with Imagery	14
	Other	5
E.	Attitude to Imagery prior to lesson.	
	Very sceptical	11
	Somewhat disbelieving	8
	Ambiguous	16
	Open minded	34
	Believing in its potential	20
	No response	2
F.	Success of Imagery exercise compared with expectations.	
	More successful	57
	As expected	30
	Less successful	3
	No response	1
G.	Impact of the Imagery exercise on student-teachers.	
	Very surprised	15
	Surprised	47
	Not surprised	26
	No response	3

Table 2: Attitude of student-teachers (1995) to the design and conduct of an Imagery exercise.

Total class size 112. Actual response to questionnaires 91 (reports available from the missing 21).

	No. of respondents
A. Effects of imagery on the behaviour of pupils.	
Calmed them down	38
Made them boisterous	5
Improved their behaviour	10
Made them behave badly	3
Enhanced their interest	61
Focused their attention	54
Class behaved as usual	5
B. Co-educational classes only: relative impact of the imagery on girls and boys.	
Girls took to the imagery more readily	16
Boys took to the imagery more readily	6
No difference in behaviour	15
C. Extent to which individual pupils were responsible for class behaviour during the imagery.	
A lot	29
Some	42
A little	14
No response	7
D. Perception of pupil enjoyment of the imagery.	
Enjoyed it more than usual	69
Responded as in other classes	17
Did not enjoy it as much as other classes	1
No response	4
Became more motivated than usual	67
Responded as in other classes	17
Became less motivated	0
No response	7

Table 3: Student-teachers' perceptions (1995) of the behaviour of their pupils.

N=91. See Table 2

		No. of respondents
A.	Student-teachers' views of the effect of the imagery exercise on the cognitive performance of their pupils in relation to the content of the imagery.	
	Improved	70
	No effect on average performance	18
	Disimproved performance	1
	No response	2
	Improved performance of high achievers	14
	Higher achievers performed as usual	67
	Disimproved performance of high achievers	5
	No response	5
	Improved performance of average students	60
	Average students performed as usual	25
	Disimproved performance of average students	1
	No response	5
	Improved performance of low achievers	75
	Low achievers performed as usual	11
	Disimproved performance of low achievers	1
	No response	4
B.	Suitability of imagery for adult, senior cycle and junior cycle class	
	Adult (>18 yrs): all adults	14
	some adults	69
	not suitable	3
	no response	5
	Senior cycle (15-18 yrs): all students	15
	some students	68
	not suitable	3
	no response	5
	Junior cycle (12-15 yrs): all students	38
	some students	50
	not suitable	1
	no response	2

Table 4.: Student teacher perceptions of the effects of imagery on their students and views of the suitability of imagery for students in different age ranges (1995)

N=91. See Table 2

	No. of respondents
A. Frequency of use of Imagery by the student-teachers in the future.	
A lot	12
Sometimes	60
Sparingly	17
Not at all	1
B. The purposes for which student-teachers would use Imagery in the future.	
To improve cognitive performance	58
To provide variety in teaching	77
To provide novelty for pupils	45
To enhance motivation	67
To enhance creativity	66
To achieve other specific objectives	3

Table 5: The Perceived Use of Imagery in the Future by the Student-Teachers (1995)

N=91. See Table 2.

	No. of respondents
Cognitive objectives achieved.	69
No response	10
Effect of the Imagery exercise on discipline.	
no change in overall discipline	30
improved discipline among those who are naughty	40
made the class more naughty	9
Had behavioural problems with class.	27
Such behavioural problems quickly resolved	25
Good or bad behaviour due to the novelty of the exercise.	
a little	16
a lot	13
Class normally of good behaviour	62
Class normally very difficult and accepted as such by staff	10
Low achieving pupils benefited from Imagery.	62
helped them better retain concepts to be acquired compared with previous performance	60
self-esteem enhanced by participation in the exercise	65
Pupils need training in guided imagery	62
Imagery exercise demanded considerable change in my attitude toward teaching	34
Imagery exercise made student change his/her role as teacher	37
Student-teachers think Imagery a valuable aid to teaching	75
No response	4
Student-teachers will try Imagery exercise, albeit in different circumstances, with different classes	76
No response	3

Table 6: Responses to questions in the 1991 questionnaire, most of which approximate to questions in the 1995 questionnaire (see also text).

N=79, unless otherwise shown.

APPENDIX

Syllabus for the Courses in the Applied Psychology of Instruction and Curriculum Studies

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I Introduction

The Higher Diploma in Education should help student teachers acquire

"the knowledge and skills which will enable student teachers to formulate and examine educational objectives, to develop and implement programmes of study, and to match these with appropriate methodologies and modes of assessment"

and provide for

"an extensive programme to develop the pedagogical and classroom management skills of student teachers through wide and varied classroom practice".

From the White Paper (1995) Charting our Education Future. Stationery Office, Dublin.

"Individual Differences: Successful teachers provided lessons geared to the individual differences of students. When there is a match between the material and student ability and interest, students worked for longer periods of time with fewer interruptions. In addition, successful teachers developed a system whereby learners were well aware of what they were to do when they had finished an assignment. Specific options were provided for students and both the teacher and students were aware of acceptable responses. In contrast, unsuccessful teachers seemed to have difficulty planning for individual differences. Students in their classes finished their work quickly and then had nothing to do, or could not do the work and gave up. Consequently, disruptive behaviours were likely to occur.

Variety: Boredom on the part of students usually results in disruptive behaviours. Teachers who use varied approaches in presenting material, unusual or different material geared to student interests, diverse questioning techniques, and who provide students with various ways of responding in class can help eliminate boredom. Knowledge of student interests and concerns is essential in planning learning activities and experiences that will reduce boredom and actively involve learners.

Teachers should try to create different types of environments for learning. Group work should be encouraged. All the evidence indicates that children highly enjoy learning in groups and develop a sense of mastery of the subject when they are required to explain subject content to fellow students. Ideally, students could select their own group. However, unless students are familiar with this mode of learning, this method of selection

can lead to disruption and injured feelings. Teachers may also wish to keep certain students apart. Each group should be given a specific number of questions or assignments, and, where possible, each group should be given a different set of assignments. The teacher should move between the groups, dealing with any 'off-task' behaviour at once."

From School Discipline: Advice for Teachers and School Authorities (1995). Association of Secondary Teachers of Ireland, Dublin.

The two courses in **Applied Psychology of Instruction** and **Curriculum Studies** aim to achieve the objectives set out above and to develop the professional skills required for teachers to develop skill in self-assessment (accountability). They are designed to enable student teachers to evaluate a range of models and theories of instruction in practice and to understand the general principles of instructional and curriculum design.

II Method

"I believe that reflective teaching is action research. It represents not just critical thought but change as a result of that thought. In short, I see teaching as research. I believe that thoughtful teachers regularly question their teaching and their students' learning, collect information to inform themselves about those questions, experiment, document, summarize and try again."

Sandra Hollingsworth (1994) in E. A. Ashburn, The Real Possibilities of Teacher-Led Inquiry for Transforming Teaching and Learning. OERI/US Department of Education.

The method used in this course is for the student-teachers to undertake research in their classrooms in order to evaluate some of the key theories and strategies of instruction. It invites the student-teacher throughout his/her teaching life to view their classrooms as laboratories for research. (In the literature this is sometimes called teacher-led research or teacher-led inquiry. In the H.Dip.Ed. it has always been called student teacher-led research.)

There are many methods of classroom action research. The approach in this particular course is confined to the one outlined below. You should during the course familiarise yourself with other methods.

III.i Aims

- To assist the student teachers to develop skill in teacher-led inquiry as it relates to course development, lesson design, implementation and evaluation.
- To relate their activities to curriculum, instruction, and self-accountability through educational connoisseurship (reflective practice), and in this way to develop a professional attitude.

III.ii Objectives

In the process of achieving these aims you will practise:

- reviewing educational research
- formulating hypotheses for the evaluation of instructional theories in the classroom
- planning lessons within normal curriculum programmes to test these programmes
- designing tests that assess both content and instructional method
- evaluating tests
- assessing yourself and your pupils
- analysing complete activities for affirmation and for change
- looking at your classroom as a laboratory for research
- understanding the limitations of your studies

III.iii Behavioural Objectives (Terminal Objectives)

At the end of the course you will be able to

- design, implement and evaluate lessons and courses
- state the aims of instruction in respect of your own courses
- state and discuss the merits of any instructional theory with which you are presented
- evaluate your own instruction and design research strategies to investigate any problem with which you are faced in the classroom.
- decide on the best approaches in your situation to obtain the entering characteristics of your students and to chart their progress.
- establish techniques for the observation of your students and your own self-assessment.

IV Lesson Plans

To achieve these goals you will undertake the following investigations, known as Lesson Plans:

1. The role of exemplars and non-exemplars in the teaching of a concept.

2/3. The merits of discovery versus expository learning (involving two lessons).

4. Should teaching be matched to learning styles? The design of a lesson to follow the Kolb learning cycle, including the application of imagery.

5. The use of heuristics in the teaching of higher order thinking skills (critical thinking, problem solving and decision making)

6. A problem with which you have been faced in your teaching this year.

V Classroom Reflection and Research

There are many ways of doing classroom research. The purposes of these exercises are, as indicated above, to help you design lessons, develop skill in reflection and help you develop skills in the evaluation of your own instruction and the instructional theories advocated by those who undertake research in this area.

a) Reflection Each exercise carries with it two exercises in reflection. The first is to be undertaken after the lesson - in the evening, say. It should be a simple but critical reflection on what happened in the class. The idea has been fully described by Eisner and there is a summary in *Considering the Curriculum during Student Teaching*. Alternatively you may consult Donald Schon's works, which have become more popular than Eisner's[1].

Each exercise, except for Lesson Plan 2/3, requires that a test be given a week or so after the exercise lesson. The time for the second and more substantive evaluation comes when you have the test results for these will tell you more about your pupils and your instruction. To aid this reflection you will be asked to read another short paper and to take the ideas in this paper into account in your final reflection.

b) Classroom research As explained above, during these exercises you will be asked to design an experiment which will replicate a research or test a theory. Because this is a type of action research you cannot expect to achieve the results which a research worker would obtain in a carefully constructed and controlled experiment. You need, therefore, to recognise the assumptions you make when you conduct your evaluations and take these into account when you judge the relevance of a theory or method. These include the size of the class (sample), its age, its prior knowledge and in particular your own

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[1] Schon, D., 1983: The Reflective Practitioner: how professionals think in action. Basic Books, New York; Schon, D., 1987: Educating the Reflective Practitioner: how professionals think in action. Jossey-Bass, San Francisco; Schon, D. (ed), 1991: The Reflective Turn: case studies in and on education practice. Teachers' Press, New York.

attitudes at the beginning of the exercise to the method or theory under investigation. You also need to recognise that while the experiment may not be perfect, it may provide you with insights into your pupils as well as your teaching.

In past years Higher Diploma students have used a variety of methods to complete the exercise. Very often limits are imposed on what they would wish to do in the ideal situation because of the circumstances in which they find themselves. When this happens considerable skill is required in the interpretation of results.

The basis of the particular scientific method advocated is that the novel method of teaching is compared with a standard method of teaching with two groups who are identical in terms of ability, gender, &c.

Group A
(control)

Separate classes;
different methods of instruction — same test

Group B
(experimental)

The test has to access the same objectives. In this way it is possible to make a comparison between the two groups. Some students have been able to teach separate classes in the exercise which compares *discovery* with *expository* teaching. For obvious reasons it is not advocated with the other exercises. You will have to find some way of dealing with the problem in your class.

Whenever comparisons are made between two groups it is necessary to record the ***mean*** and ***standard deviations*** of the test results. It is a good idea to graph the means. This will give you some idea of how weaker students, the more able students and students of different gender are responding to different types of instruction.

You will be required to undertake both sets of statistics in later exercises: you will be taught how to do standard deviations in a course on statistics. In the first exercise you should graph the distribution and provide the mean.

Your evaluation will have to take into account the previous performance of your pupils. This means that you will have to keep a record of their performance. This tabulation is called the ***entering characteristics***. The entering characteristics of a class include age, gender, present performance and a statement of where the class is in the subject. Teachers

both overestimate and underestimate where a class is and this can have disastrous consequences for their lesson.

Such listings are part of the everyday work of the teacher so this part of the exercise should be regarded as part of your normal work. These lists will be returned after they have been inspected with the lesson report. You should not include pupil surnames or the name of the school in your report. In this way confidentiality is maintained. In your evaluation you should relate your results to this prior information and perhaps to individuals (e.g. those in difficulty who have improved, bright ones who did not do as well).

Other ways of doing research which have been used by H.Dip.Ed. students are:

whole class test

Sometimes it is inevitable that such a procedure will have to be used, as, for example, in Lesson Plans 4/5.

It will be obvious that it has many disadvantages but it may be the only method available, especially for Lesson Plan 1, which requires you to teach a concept using examples. Some H.Dip.Ed. students have managed to compare the use of examples and non-examples by teaching two concepts in the same or successive lessons but using different sequences for the examples.

SINGLE LESSON

Concept A	Concept B	Test
Method 1	Method 2	

LESSON 1	LESSON 2	
Concept A	Concept B	Test
Method 1	Method 2	

Another technique which students have used is to divide the class into two groups and to teach one group by Method 1 and the other by Method 2.

Group 1
Method 1

Group 2	Test
Method 2	

There are problems with this since one of the groups has to be given something to do while the other group is taught by the experimental method. Also, the groups have to be matched for achievement and gender. There can be interference between the groups. Moreover, the control group has to do work that is related to the same objectives. This method is likely to be favoured by many students when they compare discovery with expository teaching. In that particular exercise it may be possible to send one group to the library while the other group is taught by one method, and *vice versa*. There may be another H.Dip.Ed. student in the school who can help. In any case, much depends on the goodwill of the school.

Teach Group 1	Teach Group 2	
Group 2	Group 1	Test
work on own	work on own	

In the case of the discovery/expository exercise this might have to be done over two lessons.

In the past many students have reported that their Master Teachers have been most helpful. It is recommended that you share these notes with them. We can provide them with published research reports on this course if they would like to see our evaluations.

For further reading on research, if you so wish, see L. Cohen and L. Mannion (1980), *Research Methods in Education*; D. Hopkins (1993), *A Teacher's Guide to Classroom Research*; J. Bell et al (eds.) (1984), *Conducting Small-Scale Investigations in Educational Management.*

VI Assessment

Each activity is assessed by a separate schedule. All of the schedules follow the same formula and are semi-criterion referenced. While the aim is for mastery this scheme operates within the norm-referenced system of marking which distributes scores across the range of possible marks. This means that the schedule must not be used as a simple checklist. You are expected to demonstrate understanding, insight and creativity in order to gain full marks.

The schedule contains a column for self-assessment. When you assign a mark to that section ask yourself why you award this mark. For example, if a section calls for a

maximum mark of 10, why do you give yourself 9 out of 10? What does this difference in marks mean? This will help you to come to grips with your marking of your own students.

If there is a difference between the assessor's mark and your assessment the assessor will generally try to explain why. You may renegotiate your mark with the assessor.

Remember that the assessor is comparing your mark with those of all the other scripts. Where you see **NR** it means 'by comparison with every other script'. This governs the final mark which the assessor awards. It is not necessarily the sum of all the individual scores.

VII Outline of the Lesson Plans

Each lesson plan follows the same basic outline:

1. **Entering characteristics** of your pupils: age, gender, ability &c.; where they are in the subject. The purposes of this section are twofold: a) over the year to help you develop skill in understanding your pupils. You need to keep reports on them so you are not in any way adding to your workload. It is recommended that you keep a double side of A4 so that you can record your descriptions; these may changes a the year goes on. It can be photocopied and the copy submitted with your lesson plan. (This is not meant to imply that you have to do the lesson plans with the same group of students. It is an equally good idea to do them with different groups.)

b) to help you with the evaluation of your students. In Lesson Plan 4 you will be asked to give a prediction of how your students will behave in that lesson.

2. **Theoretical (research) background** and psychological principles underlying the lesson plan topic from the prescribed reading. The extent of work required here varies from lesson to lesson. Since these lesson plans involve either the replication of research (LP1, LP2/3, LP5), this summary should concentrate on the findings of research only but sufficient to show that you understand any theoretical principles that are significant for the exercise. A thousand words should suffice. Further instructions will be given during the course.

3. **Statement of research hypothesis**; in other words, a statement of what you intend to prove or disprove.

4. **Statement of aims, non-behavioural objectives and behavioural objectives**. A particular terminology is used. It is based on Cohen & Mannion and *Pitfalls and Planning* (see references at the end of this section). The idea of objectives is to a) provide a focus for what it is you intend to do; b) help you design the test; c) help you design questions for the class; d) give you some idea of the load you are going to place on your students. Very often student teachers tend to try and do too much.

Note that a behavioural objective is something that you expect the students to be able to do as a result of the lesson, i.e. the students will be able to identify, describe, analyse. These are action words which describe what they should do in the test. You can't measure understanding, you can only infer it, so in this practice a behavioural objective would not include the word understand. Its place would be in the non-behavioural objectives.

You may be looking for behavioural change in the traditional sense of the word (i.e. a change in affect). If you wish to state objectives for this dimension put them in the non-behavioural category.

Remember:

1. that all sorts of learning will occur which can't be predicted. The objectives are to provide focus. Also find out if your students like knowing what it is you want them to achieve at the beginning of the lesson. Generally they seem to, but there are times when you would not want to let them know.

2. Sometimes the class will take off in an unintended direction. This may or may not matter. You have to judge in terms of what is important for children's learning.

Questioning

It is a good idea to prepare your questions before you go into the classroom. Read any teaching practise guide (e.g. Cohen & Mannion) and you will see that questioning is a high order skill. Many teachers do not get the most out of their questions.

5. **Formulation of the test**, showing that it tests the behavioural objectives. The test is to be given one week or thereabouts after teaching the lesson plan topic - except in the case of the exercise which compares discover and expository learning.

6. **Lesson Plan spreadsheet** (see p. 152 *Pitfalls and Planning*). It is useful to put this on a double sheet of A4. If you put the aims and objectives in a column here you should not repeat them in the text, and *vice versa*. The plan should not be too detailed, neither should it be scrimped: sufficient information should be given to show the content related to the research objective. (Getting lessons off to a good start is important. In this respect you should consult ch.1 of *Pitfalls and Planning* on Advanced Organisation.)

7. **Evaluation I**: immediate reflection on the implementation of the lesson plan. How did the lesson unfold? How did your pupils react? How did you react to certain events? Were the pupils motivated? It not, why? If you had to teach this lesson again, what would you do to improve your performance and that of your pupils? Relate answers to the entering characteristics (see above).

8. **Evaluation II**: statistical analysis of the test results. Pupils' scores, mean score, standard deviation of scores (if possible), graphs. What do the results mean? Again, you

are interested in pupil performance - who did well, who didn't? Were there improvements in the performance of particular individuals? Relate your answers to the entering characteristics.

9. **Evaluation III**: reflection and assessment on the theory based on the statistical analysis and on an additional article. Is the theory well-founded? Do your test results match previous findings? Are other criticisms of the theory valid? Did you think the method useful, and would you use it again?

10. **Evidence**: You must submit evidence that you have done the work stated. This is normally in the form of your students' tests. You should use the material in your evaluation, e.g. showing improvements or disimprovements in a student's performance, or to illustrate your observations.

VIII Introduction to the Lesson Plans

LP1: Teaching Concepts You are required to teach a concept from your subject to your pupils. It should not break the sequence of your lessons. You should first make it clear in your own mind not only what a concept is, but also what different types of concepts there are. These different types of concepts are discussed in De Cecco and Crawford (1974). You will be provided with a copy of the relevant chapter, as the book is now out of print. Having chosen the concept you wish to teach, you must decide on an appropriate method to implement the lesson plan. De Cecco and Crawford outline a seven-step method for teaching concepts by the use of examples and non-examples which you may find helpful.

Summarise the research on the teaching concepts, more especially the research on the sequencing of examples, from De Cecco and Crawford, clearly distinguishing between the different types of concepts. Formulate the hypothesis you wish to test (i.e. which of the researches you think you would like to replicate), and your aims and objectives of the lesson. Design your post-lesson test (to be administered one week later to the pupils without their prior knowledge) and draw up your lesson plan spreadsheet (see p. 152 of *Pitfalls and Planning in Student Teaching*). After the lesson, evaluate (reflect on) your performance in implementing it and your pupils' reaction to being taught a concept by the method you chose. After you administer the test, complete a statistical analysis and complete your final evaluation in the light of Howard (1987) which will be made available (it is also out of print). There will be a three-hour session to help you prepare for this lesson plan.

LP 2/3: Discovery Methods v. Expository Methods Some educationalists hold that we are born with knowledge and that the role of the teacher is to facilitate the pupil in becoming aware of what s/he has always known (teaching by discovery). Others

suggest that discovery methods have been overrated and that expository methods (lecture style) are more time-efficient and just as effective as discovery. Evaluate for yourself Bruner's, Gagne's and Ausubel's position on these matters and evaluate the usefulness of Wittrock's definition of discovery, guided discovery and expository learning (Shulman's article on these issues will be provided). For these lesson plans, which you will submit together, you are to compare a discovery method with an expository method of teaching. An effective way to approach this research is to divide your class into two groups of comparable ability and teach one group using the discovery method and the other using the expository method (other approaches are available - see above). You may assess the effectiveness of each method independently, and with different classes or year groups; however, a comparison of each method by teaching one topic to two comparable groups from the same class is probably the best (and saves a little time).

Formulate the hypothesis you wish to test. This will be concerned with proving the effectiveness of a particular method. Design your aims and objectives and show how they relate to the hypothesis. Indicate clearly on your lesson plan spreadsheet which method you are using with each group. If you teach each group at separate times then you must submit two spreadsheets, and that also means two sets of aims and objectives. The test you administer should be the same for both groups and should be given one week later, and administered a second time after one month. You want to test which group has assimilated and retained the knowledge/skills better. Your statistical evaluation is very important in this regard. What is the relationship between your two sets of results? What are the assumptions you have made? Your final evaluation should include a critique of both methods.

LP 4/5: Matching Teaching Styles to Learning Styles It is said that different people have different learning styles. This applies to your pupils as well as to you. It is also said that teachers have specific teaching styles. Should a teacher always teach in the same style? Do you know your style? Should you try to change your style to match those of your students? In this lesson plan you will try to evaluate one of several theories of learning which will help us answer these questions. The particular theory chosen is due to Kolb. You are asked (a) to come to an understanding of this theory, which suggests there are four learning styles; (b) to choose a class with which you are familiar, assign (i.e. guess) what the pupils' learning styles might be, and list them in the entering characteristics.

The main purpose of this lesson plan is to teach a topic from your subject by using different methods and materials to appeal to each quadrant of the learning cycle. Formulate your hypothesis and design objectives which coincide with each quadrant (concrete experience; reflective observation; abstract conceptualisation; active experimentation). The lesson plan should show you understand the principles of the model and the imagery you employ. In

designing your test remember that you must include questions which will test not only the knowledge and skill you have given your pupils but which also reflect the different earning styles. This will be the most difficult part of the exercise because there has to be some new learning in each quadrant. Your lesson plan spread sheet must show clearly how each objective relates to the quadrants. Having completed the post-lesson evaluation and the statistical analysis of the test results, you will be asked to re-evaluate your findings in the light of information in an article which will be distributed at the time. The purpose of this exercise is to evaluate the *value* of the theory in teaching. When you analyse the data you have to determine whether the convergers do best against the question set for them and so on. You should in your evaluation consider whether there are other ways of trying to understand how children learn. (An article by Grasha on naturalistic approaches to learning will be provided.)

School has often been criticised for stifling the imagination, yet there is evidence to suggest that the use of guided imagery, a teaching method which appeals to the affective domain, can have benefits in the cognitive domain. What are the effects of guided imagery on pupil performance? Evaluate your pupils' performance in the light of Aylwyn's and Galyean's article.

LP 6: Teaching thinking skills: problem solving and decision making

Evidence suggests that people are poor decision makers and that they could benefit from particular instruction in decision-making skills. Does your research bear this out? Should these skills be taught as a separate subject on the curriculum or must they be taught within existing subject frameworks? You are required to summarise research on teaching some thinking skills and to evaluate the usefulness of heuristic models of teaching decision making and problem solving. This means teaching the pupils a heuristic. What is the connection, if any, between problem solving, decision making and critical thinking?

Formulate your hypothesis, aims and objectives for the problem you wish your pupils to solve. Show how you plan to instruct your pupils in the application of a model and/or heuristic to solve the problem. Include this in your lesson plan spreadsheet and carry out your test and evaluations. Your final evaluation should be made in the light of your reading of the articules.

You will be provided with information about a variety of heuristics. In the last two years students have been asked to evaluate Wales and Stager's model. Mathematicians have sometimes evaluated Polya's model which was devised for mathematics.

Again, what sort of pupil benefits from the heuristic (girls, boys, high or low achievers)? In past years H.Dip.Eds. have found it useful to get prior information from pupils about how they make decisions and solve problems.

IX Doing Your Own Research

In past years we have set an examination to try to determine (a) whether you can conduct classroom research on your own; (b) whether you can spot problems that merit an inquiry by you; and (c) whether you can determine the method you would use to investigate the problem. Two of these questions are listed below.

This year we invite you to conduct your own experiment at any time during the year and to account for what happened. This should include (a) a statement of the problem, (b) any reading you could find on the issue, (c) a description of how you went about solving the problem, (d) your conclusions, and (e) evidence that you did the work. The report should be no longer than 1,500 words and completed in an examination booklet.

The questions asked in previous years were:

1. Write an essay on the following:

   In your lesson plans you undertook investigations which replicated previously published research on learning in the classroom. However, one of the goals of the course is that you should be able to design investigations which help you better to understand the significant events which you experience in the classroom. Describe any significant events which you have experienced that still requires explanation and suggest procedures for its investigation. Give a detailed example of such research. (You may not use material from your assessed lesson plans in this answer.)

The purpose of this exercise is to encourage you to develop skills in reflective practice and educational connoisseurship: that is, to treat the classroom as a place for research, the purpose of which is the improvement of your practice. It is not sufficient to replicate the research of others; you should be able to seek out your own problems and set about exploring the issues raised in a systematic way. Such problems may relate to the management of the class, a particular individual, a group of perhaps yourself.

2. "Patrick Suppes has observed, for example, that the form $3 + x = 8$ is easier for children to deal with than the form $x + 3 = 8$, and while the finding may on the surface seem trivial, closer inspection shows that it is not. Does the difficulty come in dealing with an unknown at the beginning of an expression or from the transfer of linguistic habits from ordinary English, where sentences are easier to complete when a term is deleted from the middle than from the beginning of the sentence? This issue of where uncertainty can best be tolerated and the issue f the possible interference between linguistic habits and mathematical habits are certainly worthy of careful and detailed study" (Jerome Bruner).

   Describe any similar situation which you have come across in your initial training which is not, in your opinion, adequately dealt with in the recommended books for the course.

X Reading

The set books for the course are:

1. The papers which accompany the lesson plans, which are purchased from the department.
2. Heywood, J., *Pitfalls and Planning in Student Teaching*. Kogan Page. (This is based on the experiences of Higher Diploma students.)

Also recommended are:

3. Cohen, L., and L. Mannion, *A Guide to Teaching Practice* (latest edition). Methuen.
4. Borich, G.D., *Effective Teaching Methods* (2nd edition). Macmillan, New York.

If you wish to read an introduction to educational connoisseurship see Heywood, J., *Considering the Curriculum during Student Teaching*. Kogan Page. The original text is Eisner, E. (1979), *The Educational Imagination on the Design and Evaluation of School Programs*. Collier MacMillan, New York.

Other items have been mentioned in the above text.

XI Course Structure and Attendance

The course in Applied Psychology of Instruction is spread over the year in order to facilitate reading and questioning. The periods assigned also make allowance for key reading. The course in Curriculum Studies is given at the end of the year. **Attendance at both courses is compulsory**. Failure to attend will result in your having to take a written examination at the end of the year.